Parallel execution of diagonally implicit Runge-Kutta methods for solving IVPs.

ABSTRACT

Diagonally Implicit Runge-Kutta (DIRK) methods are amongst the most useful and cost-effective methods for solving initial value problems but the dependency of the functions evaluations on the previous functions evaluations makes DIRK method not so favourable for parallel computers. In this paper we used DIRK methods which are specifically designed for parallel execution to solve a set of initial value problems. Numerical results based on the sequential and parallel modes are tabulated and compared, which shows the advantage of the algorithms based on the parallel mode.

Keyword: Diagonally Implicit Runge-Kutta (DIRK) methods; Sequential; Parallel.